


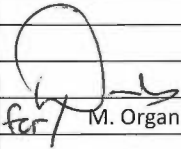
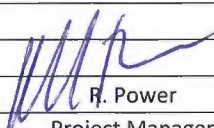
Nalcor Energy – Lower Churchill Project



LCP SMALL MAMMALS PROTECTION AND ENVIRONMENTAL EFFECTS MONITORING PLAN

Nalcor Doc. No. LCP-PT-MD-0000-EV-PL-0019-01

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1 PURPOSE

The purpose of this Small Mammals Environmental Effects Monitoring Plan (SMEEMP) is to demonstrate how any adverse environmental effects of the Lower Churchill River Hydroelectric Generation Project (the Project) will be mitigated, and to set out a program for monitoring the effectiveness of mitigation measures. To comply with regulatory requirements and commitments made in the Environmental Impact Statement (EIS), the Lower Churchill Project's (LCP) SMEEMP approach includes consideration of:

- Mitigation objectives – performance objectives in respect of each adverse environmental effect;
- Mitigation – measures planned to achieve the mitigation objectives;
- Metrics and targets – specific, quantifiable, relevant and time constrained;
- Follow-up or Monitoring Programs – how the Project will include follow-up or monitoring surveys to confirm that mitigation strategies are meeting the mitigation objectives; and
- Contingency – plan to be implemented should monitoring reveal that mitigation measures have not been successful.

The LCP's SMEEMP relates specifically to Woodland Jumping Mouse (*Napaeozapus insignis*), Pygmy Shrew (*Sorex hoyi*) and Water Shrew (*Sorex palustris*). The SMEEMP has been developed based on the commitment made by Nalcor during the Joint Review Panel hearing (CEAR 1312, p. 25), and conditions of permits and licenses for the Project.

2 SCOPE

This plan addresses the required aspects of small mammals protection and effects monitoring for the design and construction phases of the LCP including Muskrat Falls Generation and Labrador Transmission Assets (described in Section 6.0).

3 DEFINITIONS

Environmental Assessment: An evaluation of a project's potential environmental risks and effects before it is carried out and identification of ways to improve project design and

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implementation to prevent, minimize, mitigate, or compensate for adverse environmental effects and to enhance positive effects.

Environmental Management: The management of human interactions with the environment (air, water and land and all species that occupy these habitats including humans).

Environmental Management System: Part of an organization's management system used to develop and implement its environmental policy and manage its environmental aspects.

Environmental Protection Plan: Document outlining the specific mitigation measures, contingency plans and emergency response procedures to be implemented during the construction or operations of a facility.

Environmental Effects Monitoring: Monitoring of overall Project effects to confirm the predictions of EA and to fulfill EA commitments.

Environmental Compliance Monitoring: Monitoring of Project activities to confirm compliance with regulatory requirements and commitments made through the EA process.

Integrated Project Delivery Team: The integration of the Nalcor Energy and SNC Lavalin Inc. Environmental and Regulatory Compliance Teams.

4 ABBREVIATIONS AND ACRONYMS

CEAA	Canadian Environmental Assessment Act
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
C-SEPP	Component-Specific Environmental Protection Plan
CWS	Canadian Wildlife Service
EA	Environmental Assessment
EMP	Environmental Management Plan
EPP	Environmental Protection Plan
EMS	Environmental Management System
ERC	Environment and Regulatory Compliance
Gen	Generation
HSE	Health Safety and Environment
HVac	High voltage alternating current
HVdc	High voltage direct current
IBA	Impacts and Benefits Agreement
IPD	Integrated Project Delivery
LTA	Labrador Transmission Asset
LCP	Lower Churchill Project

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NE	Nalcor Energy
NLDEC	Newfoundland and Labrador Department of Environment and Conservation
OSEM	On-Site Environmental Monitor
SMPEEMP	Small Mammals Protection and Environmental Effects Monitoring Plan
RCP	Regulatory Compliance Plan
RP	Rehabilitation Plan
SARA	Species at Risk Act

5 INTERNAL REFERENCES

LCP-PT-MD-0000-PM-PL-0001-01	LCP Project Execution Plan
LCP-PT-MD-0000-PM-CH-0001-01	LCP Project Charter
LCP-PT-MD-0000-EA-PL-0001-01	LCP Generation Environmental Assessment Commitment Management Plan
LCP-PT-ED-0000-EA-SY-0001-01	Environmental Impact Statement and Supporting Documentation for the Lower Churchill Hydroelectric Generation Project
LCP-PT-ED-0000-EV-RG-0001-01	Lower Churchill Project Permit Registry
LCP-PT-MD-0000-SM-ST-0001-01	Post Environmental Assessment Release
LCP-PT-MD-0000-RT-PL-0001-01	Regulatory Compliance Plan
LCP-PT-ED-000-EN-PH-0031-01	Design Philosophy for Environmental Rehabilitation
LCP-PT-ED-0000-EN-PH-0007-01	Design Philosophy for Environmental Mitigation
LCP-PT-MD-0000-HS-PL-0001-01	Health and Safety Plan
LCP-PT-MD-0000-HS-PL-0004-01.	LCP Emergency Response Plan
LCP-PT-MD-0000-IM-PL-0003-01	Information Management Plan
LCP-PT-MD-0000-CO-PL-0001-01	Communications and Stakeholder Relations Plan
LCP-PT-MD-0000-EV-PL-0002-01	LCP Integrated Environmental Management Plan

6 PROJECT DESCRIPTION

6.1 MUSKRAT FALLS GENERATION

The Muskrat Falls Generation Project will include the following sub-components which are broken down under the five principal areas of the development:

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- 22 km of access roads, including upgrading and new construction, and temporary bridges;
- A 1,500 person accommodations complex (for the construction period); and
- A north roller compacted concrete overflow dam;
- A south rock fill dam;
- River diversion during construction via the spillway;
- 5 vertical gate spillway;
- Reservoir preparation and reservoir clearing;
- Replacement fish and of terrestrial habitat;
- North spur stabilization works;
- A close coupled intake and powerhouse, including:
 - 4 intakes with gates and trash racks;
 - 4 turbine/generator units at approximately 206 MW each with associated ancillary electrical/mechanical and protection/control equipment;
 - 5 power transformers (includes 1 spare), located on the draft tube deck of the powerhouse; and
 - 2 overhead cranes each rated at 450 Tonnes

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Figure 6-1 Muskrat Falls Generating Facility

6.2 LABRADOR TRANSMISSION ASSET (LTA)

LTA consists of the ac transmission line system from Churchill Falls to Muskrat Falls (see Figure 6-2), specifically:

- Churchill Falls switchyard extension;
- Muskrat Falls switchyard;
- Transmission lines from Muskrat Falls to Churchill Falls: double-circuit 315 kV ac, 3 phase lines, double bundle conductor, Single circuit galvanized lattice steel guyed suspension and rigid angle towers; 247 km long;
- 735 kV Transmission Line at Churchill Falls interconnecting the existing and the new Churchill Falls switchyards; and
- Labrador Fibre Project (Nalcor's participation in Aliant led initiative).

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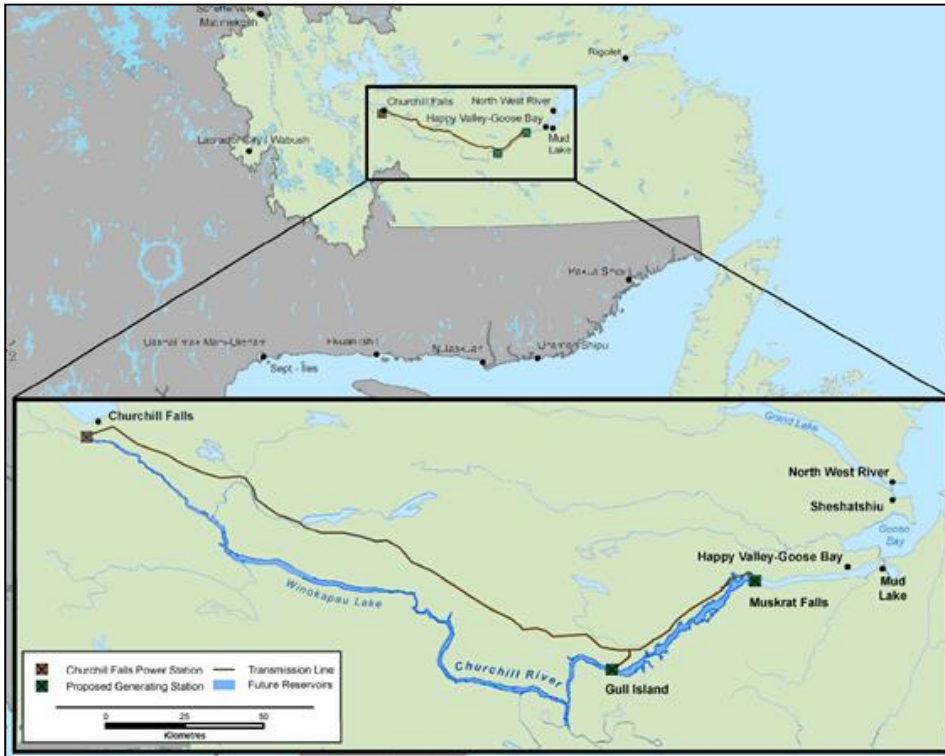


Figure 6-2 Labrador Transmission Asset

7 EXISTING INFORMATION

Existing information regarding small mammals, including Woodland Jumping Mouse, Pygmy Shrew and Water Shrew is summarized from papers presented by the Smithsonian National Museum of Natural History (Internet site) and databases of Canadian organizations (NLDEC 2013a,b; COSEWIC 2013; Wild Species 2010).

7.1 WOODLAND JUMPING MOUSE

The Woodland Jumping Mouse is small, long-tailed mouse that is native to Labrador (NLDEC 2013a). This species has adaptations that are typical of leaping mammals living in a variety of habitats. These adaptations allow individuals to make leaps of up to 4 meters (m). The Woodland Jumping Mouse has large feet and frame that provide leverage when they push off. The Woodland Jumping Mouse is almost never found in open areas. The diet of this mouse includes fungi, butterfly larvae, beetles and seeds. The Woodland Jumping Mouse hibernates about half the year (Miller 1891).

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7.2 PYGMY SHREW

The Pygmy Shrew is native to Labrador (NLDEC 2013a). The Pygmy Shrew is able to thrive in a wide variety of habitats and vegetation types. This tiny animal can live where the environment is wet, dry, cold, or warm. When frightened or agitated, it exudes a strong musky-smelling substance. This shrew is agile and can jump as high as 110 mm. Its snout is long, with conspicuous whiskers, and is constantly in motion. Pygmy Shrews have a variety of calls, including purrs, whispers, squeaks, and high-pitched whistles. They are preyed upon by, hawks, cats and foxes and, in turn, Pygmy Shrew prey on small arthropods and worms, and eat some plant matter (Baird 1857). The Pygmy Shrew and Masked Shrew (*Sorex cinereus*) closely resemble each other, and positive identification in the field is difficult. The only reliable way to distinguish between the two species is by examining the teeth. Under low magnification (e.g., with a hand lens), the side profile of the Pygmy Shrew's upper jaw shows only three large unicuspid (i.e., simple conical teeth with a single cusp or point) instead of five, which is typical of the Masked Shrew (Saunders 1988).

7.3 WATER SHREW

The Water Shrew is native to Labrador (NLDEC 2013a). Water Shrews are almost invariably found near streams or other water bodies, where they find food and can readily escape from predators. These shrews dive to the stream bottom, paddling furiously to keep from bobbing to the surface as their fur, full of trapped air, makes them buoyant. Water Shrews feed on aquatic invertebrates, insect larvae, and even small fish. When in the water, they are susceptible to predation from larger fish. On land, Water Shrew have a more typical shrew diet, feeding on a variety of invertebrates, including earthworms, snails, and insects. They also eat fungi and green vegetation (Richardson 1828).

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8 REGULATORY COMPLIANCE

Small mammals, including Woodland Jumping Mouse, Pygmy Shrew and Water Shrew are not managed provincially under the *Newfoundland and Labrador Endangered Species Act, 2004 (NLESA)* or protected under the *Species at Risk Act, 2002 (SARA)* (Species at Risk Public Registry 2013, Internet site), though they are managed under the provincial *Wildlife Act* and associated regulations.

The Woodland Jumping Mouse is ranked as “Secure” in Canada and was most recently ranked as “Undetermined” in Newfoundland and Labrador according to the General Status of Species in Canada (Wild Species 2010). Its “Undetermined” status in Newfoundland and Labrador is due to a lack of information (NLDEC 2013b). According to the Joint Review Panel (JRP) hearing transcripts (CEAR 2011), the Woodland Jumping Mouse has been found previously in one location in the Project area (Minaskuat 2008).

Pygmy Shrew and Water Shrew are also ranked as “Secure” in Canada, and were most recently ranked as “Undetermined” in Newfoundland and Labrador according to the General Status of Species in Canada (Wild Species 2010). Their “Undetermined” status in Newfoundland and Labrador is also due to a lack of information (NLDEC 2013b).

To comply with commitments to federal and provincial regulators, the LCP will undertake the following:

- Complete targeted surveys for Woodland Jumping Mouse, Pygmy Shrew and Water Shrew in appropriate habitats both within and outside the area to be inundated by the Project, to address knowledge gaps for these species.
- If the particular species are found to be present only in the area to be inundated by the Project, design and employ appropriate best management mitigation to avoid disturbance and mortality of small mammals, if possible, or design a habitat offset plan.
- If any mitigation is proposed, a monitoring or follow-up plan will be developed, as appropriate in consultation with the Newfoundland and Labrador Department of Environment and Conservation (NLDEC) Wildlife Division, to determine success of the mitigation.
- If required, address contingency plans if the mitigation is found to be unsuccessful.

The intent of the SMPEEMP is to set out the rationale and protocols for Nalcor to gather additional (to that of Minaskuat 2008) baseline data on the Woodland Jumping Mouse, and Pygmy and Water shrews to support the NLDEC Wildlife Division by adding to the limited

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knowledge of these small mammal species in the province, and to respond appropriately to the survey findings relating to the presence or absence of these particular species in the Project area.

9 ENVIRONMENTAL EFFECTS MANAGEMENT

The effects management plans (i.e., mitigation measures outlined in the EIS [Nalcor 2009]) and the Project-Wide Environmental Protection Plan (P-WEPP; LCP 2013) and the commitments made by Nalcor during the Information Request responses and the JRP hearing include the following:

- Important habitats for wildlife in general will be identified (e.g., Lower Brook) on site plans or plan profiles for roads and transmission lines for the Component-Specific Environmental Protection Plan (C-SEPP).
- To the extent practical, scheduling of activities will be limited and adaptable during sensitive periods for wildlife in general in the winter; construction activities will be scheduled considering sensitivities related to areas of wildlife habitat and periods in wildlife cycles, and considering additional mitigation measures that may be required.
- The P-WEPP and best management practices will be followed, and Environmental Monitors will oversee the implementation of the P-WEPP.
- Personal pets will not be brought to the construction site.
- Under no circumstances are wildlife to be fed and all measures will be taken to avoid inadvertent feeding.
- Wildlife will not be chased, caught, diverted, followed or otherwise harassed by Project participants.
- All wildlife sightings and nuisance wildlife will be reported to the On-Site Environmental Monitor.
- Environmental awareness training, with regular briefings, will be implemented for all Project personnel.
- When Project construction ends, all roads not essential to long-term maintenance will be decommissioned, habitat will be reclaimed, and access will be restricted.
- If used during operation, herbicide will be applied from the ground, by hand.

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10 ENVIRONMENTAL EFFECTS MONITORING

This SMPEEMP addresses the following:

- Baseline Program – studies or surveys designed and completed to gain additional knowledge of baseline conditions for Woodland Jumping Mouse, Pygmy Shrew and Water Shrew, and to inform the level to which management measures and other mitigation measures are required;
- Follow-up Program – additional studies or surveys, if deemed warranted; and
- Monitoring Program – studies or surveys designed and completed to determine whether the Project is implemented as proposed and that mitigation and compensation measures to minimize the Project’s environmental effects are implemented.

A summary of the SPMEEMP is presented in Table 1 at the end of this document.

10.1 SURVEY PROTOCOLS

Nalcor has committed to conduct baseline, follow-up and monitoring surveys for the Woodland Jumping Mouse, Pygmy Shrew and Water Shrew, as appropriate, to further inform their possible presence in and adjacent to the area to be inundated. If the species are found to be present, appropriate mitigation will be developed in consultation with the NLDEC Wildlife Division. A decision will be made as to whether expansion or reduction or deletion of the indicated program is appropriate, with justification. This will apply to the following, as appropriate:

- baseline data collection (i.e., prior to vegetation clearing for the reservoir);
- data collection during construction (i.e., prior to reservoir inundation);
- data collection during operations; and
- follow-up and monitoring report.

Data collection includes metrics that are species specific, as appropriate, quantifiable, repeatable, relevant and time constrained. The goal will be to collect meaningful data in a focused, defensible, repeatable approach, within a timeline that is reasonable, to ensure that the mitigation is appropriate. Where it is determined that the mitigation is not appropriate, a contingency plan would be presented that Nalcor could incorporate as per their Adaptive Management Plan.

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Small mammal baseline surveys were completed in the lower Churchill River valley in 2006 as part of a Wildlife Habitat Associations document that supported the environmental assessment (Minaskuat 2008). Woodland Jumping Mouse was confirmed to be present in the area in primarily Wet Spruce and Mixed-Deciduous Dominant, as well as other habitat types. Pygmy Shrew and Water Shrew were not confirmed in areas related to the Project at that time. Additional surveys will be conducted to further inform presence or absence of these species in areas within and outside the Project reservoir area before the reservoir area is cleared. Consequently, as described below, the scope of effects monitoring will include these supplemental baseline surveys and will be further developed based on the results for the three identified small mammal species. Incidental observations of Small Mammals during other Project-specific surveys will also be recorded. The work will also be completed in a manner consistent with provincial protocols.

10.1.1 Baseline Data Collection

Baseline data collection refers to the determination of the presence of Small Mammals in areas within and outside the Project reservoir area prior to Project clearing and inundation. One round of surveys will be undertaken before vegetation is scheduled to be cleared for the reservoir. Small Mammal snap trap survey grids, and specialized traps designed specifically for water shrew, will be established in suitable adjacent habitat within and outside the area to be inundated.

Survey methodology is adapted from recommended guidelines described in the methods employed by the Newfoundland and Labrador Small Mammal Monitoring Network (Rodrigues 2012), the British Columbia Resources Information Standards Committee (RISC) standards for small mammal inventories (B.C. Ministry of Environment, Lands, and Parks, Resources Inventory Branch 1998), and the Alberta Environment and Sustainable Development (ESRD 2012). Surveys will occur in late summer or early fall (i.e., between August 15 and September 30), after the breeding season, when populations are generally at their yearly maximum and the probability of capturing any species is greatest. The Network was established by government agencies, institutions and private sector consulting companies to allow comparison between sampling efforts throughout the province. The recommended procedure to determine species of small mammals in a specific area is to use snap trapping surveys with systematic sampling grids that are randomly placed within stratified habitat types. Protocols for these surveys are described in the following Tables 10-1 and 10-2.

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Table 10-1 Snap Trapping Suveys

Survey Type	Snap Trapping Surveys
Location	Lower Churchill River, Labrador
Protocol Details	<p>To measure presence of Woodland Jumping Mouse, live trap surveys will be conducted in selected habitat types both within the proposed cleared and inundated reservoir area and outside, but adjacent to, the area to be cleared or inundated. Forested areas similar to the habitat at the mouth of Lower Brook (e.g., black spruce/feathermoss forest, mixedwood forest, riparian), located immediately upstream of the proposed location of the Muskrat Falls facility, will be targeted. Trapping sites should have homogeneous habitat to the extent practical. Traps should be placed at microsites which might be attractive to mice, such as along or under woody debris or rocks, under bushes, and along worn travel trails. A cover of debris, vegetation or a lightweight board should be placed over the trap to protect captured animals from sunlight or rain.</p> <p>The following design approach is followed by the NL Small Mammal Trapping Network. Allow at least a 20m buffer from any different habitat, and mark the start of the first line at the road or trail as Line 1. Every 20m up the road mark the start of the next line until 8 lines are labeled. Ensure the last line is buffered by at least 20m of similar habitat. Mark the start of the first transect with winter weight orange flagging tape. Use a waterproof marker to label it. All lines run perpendicular from the habitat edge/road. Mark the first station 20m in from the edge of the habitat. Mark the station with line # and station# eg. 1-1. If available, take a GPS location (preferably in latitude and longitude) of the 1st and last station on line 1 and 8. If coordinates are taken in UTM's note the projection used. Alternatively mark the locations on a 1:50,000 (or larger) topographic map. Choose and use for each line the same compass bearing that is perpendicular from the habitat edge and parallel to other lines. Each station on a line is 10m apart, Flag each station and label it with a waterproof marker identifying line and sample point. Set 15 stations on each line for a total distance of 140m per line. There should be 120 stations. Use a hip chain, or measuring tape to measure all distances. An alternative is to determine how many paces are required to travel 10m and use this as a guide (NLSMMN 2008).</p> <p>Traps should be set in the evening of the first day of trapping and baited with whole oats or peanut butter mixed with rolled oats. Trapping sessions last for 3 nights. The Newfoundland and Labrador Small Mammal Monitoring Network typically traps for</p>

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	<p>three consecutive nights (Rodrigues 2012).</p> <p>Captured individuals should be identified to species, age and sex class, reproductive status, and weighed. Records of each capture should include capture (trap) station number and the biological data. Standard morphometric measurements can also be taken, including: total length, tail length, hind foot length, and ear length. Trap mortalities will be placed in Whirlpak or Ziploc bags, labeled according to transect line and trap number, and frozen. Specimens will be donated to the Newfoundland and Labrador Provincial Museum upon completion of the program.</p>
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Table 10-2 Pitfall Trap Surveys

Survey Type	Pitfall Trap Surveys
Location	Lower Churchill River, Labrador
Protocol Details	<p>Shrews are best sampled using pitfall traps. To measure presence of the two shrew species, pitfall trap surveys will be conducted in selected habitat types both within the proposed cleared and inundated reservoir area and outside, but adjacent to, the area to be cleared or inundated. Forested areas and open, moist areas will be targeted for Pygmy Shrew. For Water Shrew, riparian zones will be targeted, with pitfall traps being located as close to the water line as possible (i.e., within 5 to 10 cm). Trapping sites should have homogeneous habitat to the extent practical.</p> <p>The general design of a pitfall trap is a hole in the ground into which an unwary animal falls. The trap is usually a shallow can or bucket dug into the ground so that the rim is flush with the surface. The depth and diameter of the pit are selected to be large enough so that the target species cannot crawl or jump out. For Water Shrew, the pitfall trap depth should be at least 20 cm. Woody debris or a wood shingle is supported above the hole to protect individuals from exposure and predation, and to attract animals to the safety provided by the cover. To reduce the potential for mortalities of captured animals, drainage holes and floatable debris such as squares of Styrofoam will be placed in the trap.</p> <p>An index trap line sampling design is recommended for Pygmy Shrew: a straight transect line with 5 capture (trap) stations per line, spaced at least 60 m apart, marked with labeled flagging tape and geo-referenced using a handheld GPS unit. An array of one central and three radial pitfall traps within 3 m should be set up at each capture station. If a continuous transect of sufficient length to accommodate the 5</p>

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	<p>capture stations is not possible, the trap line may be split into shorter non-overlapping transects that sum to 5 stations. Drift fences, which can be made from 40 cm high plastic sheeting or tarp material and placed to direct animals into the pitfall traps, increase the number of individuals and species captured. For Water Shrew, a different layout is recommended for the index trap line: 20 pitfall traps spaced 15 m apart along an index trap line is recommended, as is the use of a 130 cm drift fence installed in the water, running perpendicular to the water line, as feasible.</p> <p>Traps should be set in the evening of the first day of trapping and baited with walnuts, bits of earthworm or meal worms. Bedding (e.g., coarse brown cotton) should also be provided in the traps. Capture sessions will last 3 nights, consistent with the Newfoundland and Labrador Small Mammal Monitoring Network (Rodrigues 2012).</p> <p>Captured individuals will be identified to species, age and sex class, reproductive status and weighed. Records of each capture will include trap number and the biological data. Shrews that cannot be identified in the field will be humanely euthanized in a closed container with an inhalant agent (e.g., carbon dioxide, carbon monoxide, halothane, isoflurane, sevoflurane) and submitted to species experts for identification. These individuals will be placed in Ziploc bags, labeled according to transect line and trap number and frozen. The same procedure will be undertaken with any trap mortalities. Specimens will be donated to the NL Provincial Museum upon completion of the program. Live animals will be released at or close to the capture site.</p>
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10.1.2 Data Collection during Construction

Data collection during construction, as part of the SMEEMP, will depend on the results of the baseline surveys described in Section 10.1.1. If the baseline survey results indicate that individuals of the target species are present both inside and outside the cleared or inundated reservoir area, it will be considered that while suitable habitat and individuals will be lost to clearing and flooding, the species will continue to occur in suitable habitat adjacent to the reservoir. Consequently, no further action will be taken; no additional surveys will be conducted, no additional mitigation will be deemed necessary, and no monitoring of the species will be conducted.

If the baseline survey results indicate that individuals of the target species are not found inside or outside the cleared or inundated reservoir area, no further action will be taken; no additional

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surveys will be conducted, no additional mitigation will be deemed necessary, and no monitoring of the species will be conducted.

If the baseline survey results indicate that individuals of a species are found only inside the cleared or inundated reservoir area and not outside the reservoir (e.g., Woodland Jumping Mouse individuals found only at Lower Brook or other locations within the cleared or inundated reservoir area), then additional work may be completed. Nalcor will discuss with NLDEC Wildlife Division whether it is appropriate to conduct additional surveys involving increased sampling intensity and coverage to further evaluate the presence or absence of the species. If additional sampling is conducted and the outcome remains the same, then it would be concluded that the population is found only inside the cleared or inundated reservoir area. In this situation, Nalcor will work with NLDEC Wildlife Division to develop appropriate mitigation measures (e.g., habitat offset plan, live trapping and relocation program), and a subsequent monitoring plan to evaluate the effectiveness of the mitigation.

10.1.3 Data Collection during Operations

Data will be collected for Small Mammals during Project operations only if species-specific mitigation has been developed and implemented, and an associated monitoring plan has been developed. Data collection would follow the same protocols as described for the baseline surveys. Incidental observations of Small Mammals during other Project-specific surveys will be recorded.

10.1.4 Follow-up program

A report will be generated that compiles all data collected on Small Mammals, and documents any relevant monitoring activities (i.e., regulatory compliance). This report will be submitted to the provincial Wildlife Division within the year following the survey. At this time, contingency plans are not anticipated for Small Mammals and any changes to Nalcor’s procedures or mitigation plans would be addressed through the Adaptive Management Plan, if and as appropriate. It is expected that the NLDEC Wildlife Division will continue its own data collection efforts on small mammals through the Newfoundland and Labrador Small Mammal Monitoring Network.

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11 SUMMARY

Table 11-1 Summary of the Small Mammals Protection and Environmental Effects Monitoring Plan

Survey Type	Objective	Location	Timing	Frequency	Contingency (e.g. if Small Mammals are present)
Baseline Data Collection					
Snap Trapping	<ul style="list-style-type: none"> To further determine if Woodland Jumping Mouse are present within the reservoir boundary (i.e., cleared or inundated) of the Project 	<ul style="list-style-type: none"> Suitable habitat within the reservoir boundary (i.e., cleared or inundated) 	<ul style="list-style-type: none"> Prior to inundation 	<ul style="list-style-type: none"> One survey 	<ul style="list-style-type: none"> Provide any additional data collected to NLDEC Wildlife Division
Pitfall Trapping	<ul style="list-style-type: none"> To determine if Pygmy Shrew and Water Shrew are present within and outside the reservoir boundary (i.e., cleared or inundated) of the Project 	<ul style="list-style-type: none"> Suitable habitat within and outside the Reservoir boundary (i.e., cleared or inundated) 	<ul style="list-style-type: none"> Late summer or early fall of 2013 or 2014 (i.e., between August 15 and September 30) Prior to vegetation being cleared for the reservoir 	<ul style="list-style-type: none"> One survey 	<ul style="list-style-type: none"> Provide results of trapping surveys to the NLDEC Wildlife Division With the NLDEC Wildlife Division, develop appropriate mitigation if one or both species are found only within the reservoir boundary (i.e., cleared or inundated)

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Data Collection during Construction					
Snap Trapping	<ul style="list-style-type: none"> If deemed warranted based on discussion with NLDEC, to determine if Woodland Jumping Mouse are present within the reservoir boundary (i.e., cleared or inundated) of the Project 	<ul style="list-style-type: none"> Suitable habitat within the reservoir boundary (i.e., cleared or inundated) 	<ul style="list-style-type: none"> Prior to inundation 	<ul style="list-style-type: none"> One survey 	<ul style="list-style-type: none"> Provide any additional data collected to the NLDEC Wildlife Division
Pitfall Trapping	<ul style="list-style-type: none"> If deemed warranted based on discussion with NLDEC, to determine if Pygmy Shrew and Water Shrew are present within the reservoir boundary (i.e., cleared or inundated) of the Project 	<ul style="list-style-type: none"> Suitable habitat within the reservoir boundary (i.e., cleared or inundated) 	<ul style="list-style-type: none"> Prior to inundation 	<ul style="list-style-type: none"> One survey 	<ul style="list-style-type: none"> Provide any additional data collected to the NLDEC Wildlife Division
Data Collection during Operations					
Snap Trapping	<ul style="list-style-type: none"> If deemed warranted based on discussion with NLDEC, to determine if Woodland Jumping Mouse are present in the Project area 	<ul style="list-style-type: none"> Suitable habitat within the Project area 	<ul style="list-style-type: none"> Post-inundation in late summer or early fall (i.e., between August 15 and September 30) 	<ul style="list-style-type: none"> One survey 	<ul style="list-style-type: none"> Provide any additional data collected to the NLDEC Wildlife Division
Pitfall Trapping	<ul style="list-style-type: none"> If deemed warranted based on discussion with NLDEC, to determine if Pygmy Shrew and Water Shrew are present in the Project area 	<ul style="list-style-type: none"> Suitable habitat with the Project area 	<ul style="list-style-type: none"> Late summer or early fall (i.e., between August 15 and September 30) 	<ul style="list-style-type: none"> One survey 	<ul style="list-style-type: none"> Provide any additional data collected to the NLDEC Wildlife Division

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Follow-up and Monitoring					
	<ul style="list-style-type: none"> To document Small Mammal presence in the Project area, including incidental observations recorded during other Project specific surveys, and any follow-up activities related to Small Mammals. Verify regulatory compliance in relation to Small Mammal requirements 	<ul style="list-style-type: none"> Project area 	<ul style="list-style-type: none"> Interim Report following baseline surveys; Final report after additional surveys and monitoring, if deemed warranted 	<ul style="list-style-type: none"> One report following baseline surveys; one report following additional surveys and monitoring, as appropriate 	<ul style="list-style-type: none"> Not applicable

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